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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,054	11/25/2003	Carol Jeffcoate	HO2-0002	7777

7590 08/30/2007 Honeywell International Inc. 101 Columbia Road P.O.Bpx 2245 Morristown, NJ 07962		EXAMINER CHUO, TONY SHENG HSIANG
ART UNIT 1745	PAPER NUMBER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/723,054	Applicant(s) JEFFCOATE, CAROL	
	Examiner Tony Chuo	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Claims 12-25 are currently pending. No amendments have been made to the claims. The applicant's arguments have been carefully considered. However, upon further consideration, claims 12-25 stand rejected under the following 103 rejections.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 12, 13, 16-20, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai (JP 2002-141077) in view of Kaneko (JP 06-318736). The Shirai reference discloses a fuel cell stack "10" comprising: solid polymer electrolyte fuel cells "1" that are proton exchange membrane fuel cells; thermoelectric elements "7" in between adjacent fuel cells "1" in the fuel cell stack wherein each thermoelectric element "7" is adjacent and in contact with the fuel cell "1"; and field plate "8" for cooling agents that functions as a heat sink in thermal contact with a periphery of the fuel cell stack (See paragraphs [0015],[0027] and Drawing 3). It also discloses a thermoelectric element "7" that comprises a p-type semiconductor "7A" and a n-type semiconductor "7B" which essentially forms a Peltier device (See paragraph [0018] and Drawing 2). It

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also discloses measuring the temperature of the oxygen pole side field plate and also the temperature of the thermoelectric element (See [0009]). Examiner's note: It is inherent from the teachings of Shirai that each thermoelectric element comprises one or more temperature sensing devices that are connected via control circuitry.

However, Shirai does not expressly teach adjusting a voltage of a power source in response to the measured temperature to heat or cool the fuel cell assembly in contact with the thermoelectric layer wherein the thermoelectric layer comprises one or more thermoelectric devices in electrical communication with the power source. The Kaneko reference discloses a method of controlling the temperature of a temperature-controlled object by using a Peltier thermoelectric element comprising: a step of passing a current by electrical potential difference in the direction of a part connected to the p-type thermoelectric material from the part connected to the n-type thermoelectric material in order to cool the temperature controlled object; and a step of reversing the direction of the current in order to heat the temperature controlled object (See paragraphs [0016],[0022]). Examiner's note: It is inherent in the Kaneko reference that a power source is electrically connected to the thermoelectric element in order to control the electric potential difference of the thermoelectric element. It is also inherent that the heat distribution of the fuel cell assembly will be substantially uniform as a result of heating or cooling the fuel cell stack by using the Peltier device.

Therefore, one of ordinary skill in the art would have been capable of applying this known technique of controlling the temperature of a temperature controlled device by passing a current by electrical potential difference in the direction of a part connected

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to the p-type thermoelectric material from the part connected to the n-type thermoelectric material in order to cool a temperature controlled object; and reversing the direction of the current in order to heat the temperature controlled object, to a known device (fuel cell with a Peltier device) that was ready for improvement and the results would have been predictable to one of ordinary skill in the art (See *KSR International Co. v. Teleflex Inc.*).

Examiner's note: The Kaneko reference is relevant to the Shirai reference and the applicant's field of endeavor because it solves the same problem of regulating the temperature of a temperature controlled object by using a Peltier device.

4. Claims 14 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai (JP 2002-141077) in view of Kaneko (JP 06-318736) as applied to claim 12 and 18 above, and further in view of Doke (US 5576512). However, Shirai as modified by Kaneko does not expressly teach a power source that is a battery. The Doke reference discloses thermoelectric systems where the power source is a battery (See column 2, lines 30-35). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shirai/Kaneko method of controlling the temperature of the fuel cell stack to include a power source that is a battery in order to be able to heat the fuel cells during start-up without using electrical energy generated by the fuel cells.

5. Claims 15 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai (JP 2002-141077) in view of Kaneko (JP 06-318736) as applied to claim 12 and 18 above, and further in view of Cargnelli et al (US 5753383). However, Shirai as

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modified by Kaneko does not expressly teach a power source that is the fuel cell assembly. The Cargnelli reference discloses a thermoelectric element that is electrically connected to the fuel cell stack so that the fuel cells' current can be applied to the Peltier module to create a temperature gradient or difference across the element (See column 4, lines 47-51). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shirai/Kaneko method of controlling the temperature of the fuel cell stack to include a power source that is the fuel cell assembly in order to more efficiently utilize the power generated by the fuel cell stack to maintain the fuel cell at a uniform temperature.

6. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shirai (JP 2002-141077) in view of Kaneko (JP 06-318736) as applied to claim 12 and 18 above, and further in view of Walsh (US 2003/0044662). However, Shirai as modified by Kaneko does not expressly teach temperature sensing devices that are thermocouples. The Walsh reference discloses a thermocouple coupled to a control circuit for regulating the temperature of the fuel cell (See paragraph [0026]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Shirai/Kaneko method of controlling the temperature of the fuel cell stack to include thermocouples associated with each thermoelectric device so that temperature of the fuel cell can be more reliably measured.

Response to Arguments

7. Applicant's arguments filed 6/20/07 have been fully considered but they are not persuasive.

The applicant argues that a statement that modifications of the prior art to meet the claimed inventions would have "well within the ordinary skill of the art at the time the claimed invention was made" because the references teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. As stated above, one of ordinary skill in the art would have been capable of applying a known technique to a known device that was ready for improvement and the results would have been predictable to one of ordinary skill in the art.

The applicant also argues that Kaneko is completely silent as to measuring the temperature-controlled object and adjusting the voltage of a power source in response to said measurement. The Kaneko reference teaches a method of controlling the temperature of a temperature-controlled object by using a Peltier thermoelectric element. In order to control the temperature of the temperature-controlled object at any specific temperature, the temperature of the temperature-controlled object would inherently be measured. Therefore, the Kaneko reference inherently and explicitly teaches measuring the temperature of the temperature-controlled object and adjusting the voltage of a power source in response to the measurement.

The applicant also argues that placing the Kaneko Peltier device inside of applicant's fuel cell assembly or fuel cell stack would prevent the heat dissipation electrode from coming in direct contact with the atmosphere; rendering the Kaneko Peltier device inoperable. The Kaneko reference is relied upon to teach a method of

operating the Peltier device to heat or cool a temperature controlled device, instead of placing the Kaneko Peltier device inside of a fuel cell stack. Since the Shirai reference already discloses a fuel cell assembly with a Peltier device, there would be no need to place the Kaneko Peltier device inside of the Shirai fuel cell stack.

The applicant also argues that the Shirai reference teaches away from using the Kaneko Peltier device and the two references cannot be operably combined to meet the applicant's invention and the Kaneko reference teaches away from placing its Peltier device in a fuel cell or fuel cell stack. Once again, the Kaneko Peltier device is not being placed inside the Shirai fuel cell stack. Therefore, the cited references would not teach away from each other and from the applicant's claimed invention.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC


JONATHAN CREPEAU
PRIMARY EXAMINER